Toilet Seat

The present invention relates in general to deodorising foul air from a toilet pan using a filter.

Numerous proposals have been made for filtering foul air from toilet pans to deodorise the foul air. There are a number of known systems involving a filter outside the toilet pan, but such systems are in general bulky and costly, as well as being difficult to fit to the toilet pan. To avoid these problems, it has been suggested to fit in the toilet seat itself both a filter and a fan to draw air from the toilet pan through the filter. For example, US-5,079,783 discloses such a toilet seat.

However, if a fan and filter are arranged in the toilet seat, there is a significant problem of achieving a sufficient deodorising action. This is because it is undesirable to significantly increase the size of the toilet seat as compared to the normal size for a toilet seat, which places a size limitation on the filter and fan. If the filter is too small, then odours may pass through without being removed. If the fan is too small, for a given size of filter, then there may be insufficient air flow through the filter.

The present invention is concerned with maximising the deodorising action of a filter system arranged in a toilet seat for the purpose of providing a filter system which balances the demands of being effective without unduly increasing the size of the toilet seat.

According to a first aspect of the present invention, there is provided a toilet seat comprising:

an annular seat member having an internal duct extending around the central opening in the annular seat member from an inlet formed in the annular seat member for receiving foul air from a toilet pan to an outlet formed in the seat member;

at least one filter for deodorising foul air from the toilet pan for arrangement in the duct for deodorising foul air from the toilet pan; and

fan means arranged in the duct for creating air flow along the duct through the air filter,

wherein the filter is fixed to a cartridge which is removably insertable into the annular seat member through an aperture formed in the outer circumferential side of

the annular seat member, and the outlet of the duct is formed in an outer wall of the cartridge which fits in the aperture on insertion of the cartridge into the annular seat member.

As the filter and fan means are arranged in a duct extending around the central opening in the annular seat member, it is possible to maximise the deodorising action. This is because the filter and the fan means may be arranged in different positions around the central opening. This allows the size of the fan means and the filter to be maximised within the constraints of fitting them within the annular seat member without unduly increasing its cross-sectional area radially thereacross. This contrasts with arranging both the fan and the filter in a duct extending across the seat member which limits the size of the filter and the fan and makes it difficult to choose a position filtering effect.

When using such a duct extending around the annular seat member, further advantage may be achieved by providing the filter fixed to a cartridge in accordance with the first aspect of the present invention. It is desirable for the filter to be fixed to a cartridge which may be movably inserted into the annular seat member to allow periodic replacement of the filter. An aperture in the outer circumferential side of the annular seat member provides an additional advantage in that it is most convenient to form the outlet of the duct in the outer wall of the cartridge which fits into that aperture. Consequently, the outlet is itself formed in the outer circumferential side of the annular seat member. It has been appreciated that such a location of the outlet in the outer circumferential side improves the filtering efficiency as compared to locating the outlet in the lower surface of the annular seat member. Firstly, locating the outlet in the outer circumferential side reduces the degree of turbulence within the toilet pan which can disrupt the air flow into the inlet. Secondly, the filtered air may be more easily exhausted from an outlet in the outer circumferential side.

Preferably, the cartridge includes a rigid housing extending around the filter. Such a rigid housing provides protection for the filter itself.

Desirably, the filter is arranged to cover the outlet, and the duct provides a gap adjacent the filter for air to flow into the filter extending along the length of the

filter around the central opening in the annular seat member. Such a gap improves the filtering efficiency as will be described in more detail below with reference to the second aspect of the present invention.

Advantageously, the cartridge includes further walls extending from said outer wall around the filter, said gap being provided between the filter and the further walls. The walls have the advantage of protecting the filter prior to insertion in the toilet seat. Provision of the gap between the filter and the further walls, that is within the cartridge itself, maximises the surface area of the filter into which air can flow and therefore maximises filtering efficiency.

An alternative arrangement would be for the further walls of the cartridge to be arranged directly against the filter. In this case, the gap would be provided between the further walls of the cartridge and the inside surface of the seat member and the further walls would be arranged with openings to allow air flow into the filter. However, with such an arrangement, the surface area of the filter available for air to flow into the filter would be reduced, which would reduce filtering efficiency.

Advantageously, said toilet seat includes means for biasing the cartridge out of the annular seat member and a releasable catch for retaining the cartridge in the annular seat member. Such an arrangement makes the cartridge easy to replace. In particular, by releasing the catch, the passing means forces the cartridge outwardly for ease of removal.

Desirably, the releasable catch comprises at least one tab provided on the cartridge and engageable in a corresponding aperture extending through the lower surface of the annular seat member so as to be releasable by pressing the at least one tab. Such a releasable cartridge has a simple construction which is easy to manufacture, and is also simple to use because the catch may release simply by pressing the tab. By providing the aperture in the lower surface of the annular seat member, the tab is hidden and not contacted by someone sitting on the toilet seat which could be uncomfortable or cause accidental release.

According to a second aspect of the present invention, there is provided a toilet seat comprising:

an annular seat member having an internal duct extending around the central opening in the annular seat member from an inlet formed in the annular seat member for receiving foul air from a toilet pan to an outlet formed in the seat member;

at least one filter for deodorising foul air from the toilet pan arranged in the duct; and

fan means arranged in the duct for creating air flow along the duct through the air filter,

wherein the filter is arranged to cover the outlet, and the duct provides a gap adjacent the filter for air to flow into the filter extending along the length of the filter around the central opening in the annular seat member.

As the filter and fan are arranged in a duct extending around the opening in the annular seat member, it is possible to maximise the deodorising action as described above with reference to the first aspect of the present invention.

Where the filter and fan are so arranged in a duct extending around the opening in the annular seat member, further advantage may be achieved in accordance with a second aspect of the present invention by arranging the filter to cover the outlet and providing a gap adjacent the filter extending along the length of the filter. The gap allows air to flow into the filter along its entire length. Thus, whilst the air flow through the duct is around the opening in the annular seat member, the air flow through the filter is sideways through the filter. This minimises the resistance provided by the filter to the air flow and therefore increases efficiency. It allows the entire length of the filter to be used effectively to filter the foul air. Furthermore, the length of the filter may be freely increased to increase the degree of filtering without suffering a reduction in the resistance of the filter to air flow.

Preferably, the outlet of the duct is arranged in the outer circumferential side of the annular seat member. This improves filtering efficiency as described above with reference to the first aspect of the invention.

Desirably, the filter is disposed directly against the outlet, because this is the simplest arrangement which minimises space wastage and is easy to construct. However, this is not essential and instead the filter may be offset from the opening

with a duct therebetween.

According to a third aspect of the present invention, there is provided a toilet seat comprising:

an annular seat member pivotally attached at a rearward position around the central opening in the annular seat member to fittings for fixing the annular seat member to a toilet pan, the annular seat member having an internal duct extending from an inlet formed in the annular seat member for receiving foul air from a toilet pan to an outlet formed in the seat member;

at least one filter for deodorising foul air from the toilet pan arranged in the duct;

fan means arranged in the duct for creating air flow along the duct through the air filter; and

at least one battery for providing power to the fan means,

wherein the battery is disposed inside the annular seat member at a position forward of the duct containing the fan means and the at least one filter.

In practice, the size of the batteries for providing power to the fan means needs to be fairly large to provide a reasonable lifetime before they need replacement. It is desirable to provide the batteries inside the annular seat member to avoid the need for a separate mounting and connection to the seat member, for example in the toilet seat lid or a pack attached elsewhere. It has been appreciated that more efficient filtering may be achieved if the batteries are provided forward of the duct, because in this case the inlet is towards the rear portion of the annular seat member. Such a location for the inlet has been found to improve the extraction of air from the toilet pan. This is thought to be because toilet pans are generally deeper in the rear portion.

Such advantages are further enhanced where the internal duct extends around the central opening in the annular seat member.

Advantageously, the inlet of the duct is disposed at a position around the opening adjacent the hinge, because this location has been found to provide the best position for extraction of air from the toilet pan.

In such a case, the filtering efficiency may be further improved by use of a duct which forms two flow paths each extending from said inlet to a respective outlet in opposite directions around the opening, a filter being arranged in each flow path in parallel.

According to a fourth aspect of the present invention, there is provided a toilet seat comprising

an annular seat member having an internal duct forming at least two flow paths each extending in parallel along a different portion of the annular seat member around the central opening in the annular seat member from an inlet formed in the annular seat member for receiving foul air from a toilet pan to an outlet formed in the seat member,

the annular seat member having arranged in each flow path formed by said said duct:

at least one filter for deodorising foul air from the toilet pan; and

a fan unit having a fan inlet and a fan outlet at opposite ends thereof for creating air flow along the duct through the air filter, the fan unit being arranged with the fan inlet and fan outlet aligned in a direction around the central opening in the annular seat member.

As the filter and fan are arranged in a duct extending around the opening in the annular seat member, it is possible to maximise the deodorising action as described above with reference to the first aspect of the present invention.

In such a case where the ducting extends around the annular seat member, it has been appreciated that the provision of two air filters provides a surprising advantage, as compared to the provision of a single filter of equivalent size to the total size of the two air filters. As there is a separate air flow over each filter, the deodorising action is improved, as compared to the use of such a single filter. In particular, it is possible to reduce the speed of the air flow created over each of the air filter, because each of the air filters may be shorter than a single air filter acting in isolation. Ths increases the contact time for the air flowing over each filter which increases filtering efficiency and hence the deodorising action. In accordance with a

fourth aspect of the present invention, two such air filters are provided in separate flow paths in parallel, each having a fan unit in which the fan inlet and the fan outlet are aligned in a direction around the opening in the annular seat member. This orientation of the fan unit increases their effectiveness.

Preferably, in accordance with all aspects of the present invention, the air filter comprises activated carbon. Particular advantage is achieved by the air filter comprising activated carbon dispersed in a porous support. This improves the efficiency of the filter because the foul air can pass through the porous support and flow around the activated carbon dispersed therein. This maximises the contact between the foul air and the activated carbon, thereby maximising the efficiency of the filter. The porous support also holds the activated carbon in place which limits conglomeration of the activated carbon, as well as preventing rattling when the toilet seat is moved.

In general, any porous support may be used but preferably the porous support is foam.

Preferably, the activated carbon is formed as pellets, but alternatively the carbon may take other forms, for example a fine powder.

The various aspects of the present invention and the preferred features thereof may be used together in any combination.

To allow better understanding, a toilet seat which embodies the present invention will now be described by way of non-limitative example with reference to the accompanying drawings, in which:

Fig. 1 is a view from the rear, left side and above of the toilet seat with its lid closed;

Fig. 2 is a view from the right side and above of the toilet seat with its lid open;

Fig. 3 is a view from below of the toilet seat;

Fig. 4 is a view from the rear, left hand side of the cover of the seat member of the toilet seat;

Fig. 5 is a view from below and the left side of the cover;

Fig. 6 is a view from above and the right side of the seat member of the toilet seat with the cover removed showing the various components arranged inside the seat member;

Fig. 7 is a view from the rear and above of the base of the seat member of the toilet seat;

Fig. 8 is a view of one of the filter cartridges for mounting in the toilet seat viewed outwardly of the opening in the seat member, the other filter cartridge being a mirror image thereof; and

Fig. 9 is a cross-sectional view of the toilet seat, including the filter cartridge, taken along the line IX-IX in Figs. 2 and 6, radially of the opening in the seat member.

Figs. 1 to 3 illustrate a toilet seat 1 which embodies all the aspects of the present invention.

The toilet seat 1 comprises an annular seat member 2 and a lid 3 having an external form and dimension typical of a conventional toilet seat. The seat member 2 and lid 3 are coupled by respective hinge portions 4 and 5 which allow the lid 3 to pivot relative to the seat member 2 between a closed position as shown in Fig. 1 and an open position as shown in Fig. 2.

The seat member 2 is pivotally coupled to a pair of fittings 6 for attachment to a toilet pan 50. In a conventional manner, the fittings 6 each have a screw 7 for insertion through one of the apertures 51 conventionally located on the rear portion of the toilet pan 50 as shown by the dotted lines in Fig. 1. A nut 8 may be screwed onto the screw 7 for holding the fittings 6 in place. Once the fittings 6 are fixed to the toilet pan, the seat member 2 extends around the rim of the toilet pan 50 and it is supported thereon by side lugs 9 spaced around the side of the seat member 2 and a front lug 10 positioned directly opposite the fittings 6 at the front edge of the seat member 2.

The seat member 2 is formed from two parts, namely a base 11 as best seen in Figs. 3, 6 and 7 and a cover 12 as best seen in Figs. 2, 4 and 5. Both the base 11 and cover 12 are generally annular. The base 11 and cover 12 may each be manufactured

integrally, for example by moulding from any suitable material, typically a plastics material. They are fixed together to form the seat member 2.

The base 11 is a generally flat wall which in use forms the lower surface of the seat member 2. In particular, the side lugs 9 and front lug 10 protrude from the lower surface of the base 11.

The cover 12 is formed as a sheet which is arched when viewed in cross-section radially of the annulus of the annular seat member 2. The cover 12 in use forms the upper surface of the seat member 2 and is sat upon by the user. The hinge portion 4 of the seat member 2 is formed integrally with the cover 12 at a rearward position around the seat member 2.

Due to the arched shape of the cover 12, when the base 11 and cover 12 are fixed together, there is left a space therebetween which forms a duct 13 and houses various components of the toilet seat. The internal arrangement and components of the toilet seat 1 will now be described. As a preliminary point, it is noted that the arrangement and components of the toilet seat 1 are symmetrical on either side of an imaginary line from the front to the back of the toilet seat 1.

The duct 13 formed between the base 11 and cover 12 extends in the rear portion of the seat member 2 around the opening 14 in the seat member 2. In the drawings, the duct 13 is illustrated by a dotted arrow showing the direction of air flow along the duct 13. In particular, the duct 13 extends from an inlet 15 formed by a plurality of holes 16 in the base 11. The inlet 15 is disposed at a rearward position around the opening 14 adjacent to the fittings 6 by which the seat member 2 may be fixed to the toilet pan 50.

From the inlet 15, the duct 13 provides two separate flow paths in parallel with one another around the respective sides of the toilet seat.

Within the duct 13, there is a respective fan unit 17 disposed in each flow path at the rear portion of the seat member 2 immediately after the inlet 15. When operated, the fan units 17 drive air flow through the duct 13. The fan units 17 are cylindrical and each have an inlet 18 and outlet 19 at opposite ends. The inlet 18 and outlet 19 are aligned along the respective flow path of the ducts 13 in a direction

around the central opening 14 in the annular seat member 2. This orientation of the fan units 17 maximises the air flow they create in operation.

At a rearward position around the seat member 2, the base 11 has a curved portion 37 protruding downwardly from the remainder of the base 11 to form a recess 38 in which the fan units 17 are located. The curved portion 37 protrudes to the same level as the side lugs 9 and the front lug 10 and thus additionally supports the seat member 2 on the rim of the toilet pan 50. The fans 17 are located and held in place by respective ribs 20 formed on the base 11 in the recess 38 and corresponding ribs 46 formed in the lower surface of the cover 12.

Two filter cartridges 21 are mounted in the seat member 2 on opposite sides thereof. In particular, each filter cartridge 21 is disposed inside a respective one of the flow paths of the duct 13 in series with the fan units 17. On the forward side of the filter cartridges 21, the duct 13 is closed by a wall 22 formed integrally with the cover 12 and extending radially across the seat member 2.

The filter cartridges 21 may be inserted in the direction A into the seat member 2 through respective apertures 23 formed in the cover 12 on the outer circumferential side 24 of the seat member 2.

The filter cartridges 21 will now be described with reference to Figs. 8 and 9.

The filter cartridges 21 each have an outer wall 25 which fits flush in the aperture 23 formed in the cover 12 of the seat member 2. An outlet 26 of the duct 13 is formed by an array of holes 27 in the outer wall 25 of the filter cartridge 21.

The filter cartridge 21 further includes a filter 28 in the shape of an elongate block extending along the entire length of the filter cartridge 21 around the opening 14 in the seat member 2. The filter 28 entirely covers the outlet 26 formed by the holes 27 in the inner surface of the outer wall 25.

Fixed to the outer wall 25, the filter cartridge 21 has further walls 29, including a lower wall 29a, an inner wall 29b and an upper wall 29c, extending around the filter 28 so that in cross-section radially of the opening 14 of the seat member 2, the outer wall 25 and the further walls 29 extend around the entire circumference of the filter 28. Thus, the outer wall 25 and the further walls 29

together constitute a rigid housing extending around the filter 28 for protecting the filter 28.

The filter 28 fills the cavity formed by the outer wall 25 and further walls 29 of the cartridge 21. The filter 28 comprises a closed foam container 31 fixed to the outer wall 25 and further walls 29 of the cartridge 21, the container 31 being filled with coated pellets 32 of activated carbon. The pellets 32 are in themselves of a conventional form. The activated carbon in the pellets 32 of the filter 28 filters air passing through the filter 28 by absorbing odorous compounds such as sulphides and ammonia. The foam container 31 allows the flow of foul air therethrough. The pellets 32 could be replaced by other forms of activated carbon, for example a powder, but the advantage of the pellets 32 is that their size prevents their movement through the foam container 31.

As an alternative, the filter 28 could comprise a foam support (or any other form of porous support, for example a fibrous or honeycomb material) in which are dispersed coated pellets of activated carbon or another form of activated carbon such as a powder. In such a case the foam support would allow the flow of foul air around the pellets of activated carbon, thereby providing a high degree of contact between the foul air and the activated carbon which assists the filtering process. The foam support would also hold the activated carbon pellets in place dispersed through the filter, thereby preventing the pellets from conglomerating together, and also from rattling.

Each filter 28 is preferably surrounded, within the cartridge 21, by a gas-permeable fluid-impermeable membrane 33. The membrane 33 protects the filter 28 from fluid which might ingress into the seat member 2 when in use on a toilet pan, while allowing foul air to pass through the filter 28 for filtration.

As shown in Fig. 9, the lower wall 29a of the cartridge 21 sits directly against the upper surface of the base 11 without any gap but the inner wall 29b and the upper wall 29c are spaced from the lower surface of the cover 12 to provide therebetween a gap 30. The gap 30 extends along the entire length of the filter 28 inside the filter cartridge 21. Adjacent the gap 30, the inner wall 29b and the upper wall 29c have

openings 35 therethrough to allow communication from the gap 30 to the filter 28. Therefore, the gap 30 allows foul air to flow into the filer 28 along the entire length of the filter 28 around the central opening 14 in the seat member 2. Thus, on operation of the fan units 17, the air flow driven through the duct 13 passes into the gap 30 outside the filter cartridges 21, through the filters 28 and out of the seat member 2 through the outlet 26.

Thus, as a result of the provision of the gap 30, the air flow through the filter 28 is generally sideways across the filter 28, that is outwardly of the opening 14 in the seat member 2, whereas the air flow along the duct 13 is generally around the opening 14 in the seat member 2. By providing the duct 13 extending around the opening 14 and the seat member 2, the fan units 17 and the filter 28 are disposed at different positions around the opening 14. This allows the size of both the fan units 17 and the filter 28 to be maximised within the space inside the seat member 21. However, the provision of the gap 30 means resulting in generally sideways air flow through the filter 28. This means that the resistance to the air flow provided by the filter 28 is minimised as compared to direction of air flow through the filter 28 being around the opening 28, that is along the length of the filter 28. By thus minimising the resistance to air flow provided by the filter 28, the deodorising action of the filter 28 is improved, because the entire length of the filter 28 around the opening 14 may be utilised to provide filtering. Furthermore, the reduction in resistance means that a relatively lower power fan unit 17 is required to drive the air flow. This similarly allows a slower air flow through the filter 28 which increases the contact time and thus increases the filtering efficiency. The length of the filter 28 may be designed to have any length without suffering a corresponding reduction in the air flow resistance of the filter 28.

The cartridges 21 are each provided with two tabs 34 on the lower surface of the further walls 29. The tabs 34 are inclined downwardly from the lower surface of the further walls 29 as viewed outwardly of the opening 14 in the seat member 2, but are resiliently deflectable to lie flush with the further walls 29. Such deflection of the tabs 34 occurs while the cartridge 21 is slid into the seat member 2 through the

aperture 23.

The base 11 of the seat member 2 has respective apertures 35 having a corresponding shape and position to the tabs 34 so that after insertion of the cartridges 21 into the seat member 2, the resilience of the tabs 34 causes them to locate in the apertures 35. Thereafter, engagement of the tabs 34 against the apertures 35 in the base 11 retains the cartridge 21 in the seat member 2. Thus, the tabs 34 act as a catch. The tabs 34 are releasable by means of manually pressing the tabs 34 upwardly into the base 11 of the seat member 2, whereupon the cartridges 21 are free to be removed from the seat member 2 through the apertures 23.

To assist the removal of the cartridges 21, a respective spring 36 is fixed adjacent each filter cartridge 21 on the inner surface of the inner circumferential side 45 of the cover 12 in a position opposite the apertures 23 so as to be compressed by the respective cartridge 21 on insertion into the seat member 2. Thus, the spring acts to bias the cartridges 21 out of the annular seat member 2. This assists removal of the cartridges 21 by causing them to spring outwardly after the tabs 34 are released. The spring 36 could be replaced by any resilient or other means for biasing the cartridges 21 outwardly.

The reason for making the cartridges 21 removable is to allow for periodic replacement of the cartridges 21. It is particularly convenient for the outlet 26 to be formed in the cartridge 21 rather than the base 11 or cover 12 of the seat member 2, because this avoids the need for any opening in the seat member 2 other than the aperture 23 which is needed for removal and insertion of the cartridges 21. By providing the location of the aperture 23 in the outer circumferential side 24 of the seat member 2, the opening 26 is similarly provided in the outer circumferential side 24. This location for the outlet 26 in the outer circumferential side 24 of the annular seat member 2 improves the filtering efficiency as compared to the outlet being in the lower surface of the annular seat member 2. Firstly, the air exiting from the outlet 26 does not create turbulence within the toilet pan which can disrupt the air flow into the inlet 15. Secondly, this location for the outlet 26 allows air to be more easily exhausted.

The fan units 17 have sufficient power to blow air through the duct 13, and in particular through the filters 28. The power of the fan units 17 are selected to balance two competing factors. On one hand, it is desirable to increase the flow rate to maximise the amount of foul air from the toilet pan 50 which is filtered, before that foul air escapes beyond the toilet pan 50 through the opening 14 in the seat member 2 and in the gap between the seat member 2 and the rim of the toilet pan 50. On the other hand, reducing the flow rate has the benefit of increasing the contact time between the foul air and the filters 28 which in turn improves the efficiency of the filters 28 in deodorising foul air.

The fan units 17 are powered by batteries 39 arranged in two battery packs 40. The battery packs 40 fit in apertures 41 formed in the base 11 of the seat member 2 allowing removal of the battery packs for replacement of the batteries 39. The battery packs 40 are secured in the apertures 41 by screws 42 extending through the battery packs 40 into the base 11. The battery packs 40 are arranged in the forward portion of the seat member, in particular forward of the ducts 13 containing the fan units 17 and the filters 28. This is a particularly convenient location for the battery packs 40. Location of the batteries 39 in the seat member 2 itself which avoids the need for a separate mounting and an external connection to the seat member 2. By providing the battery packs 40 in the forward portion of the seat member 2, this allows the duct 13 and in particular the inlet 15 to be in the rearward portion of the seat member 2, which has been found to provide more effective filtering than providing an inlet in the forward portion of the seat member. In particular, the most effective location for the inlet has been found to be the rearmost side of the seat member 2.

The seat member 2 is additionally provided with a microswitch 43 located on the foremost side of the seat member 2 in the base 11 aligned with the front lug 10. The microswitch 43 is switched by force applied to the front lug 10 relative to the seat member 2 and in particular is sensitive to the weight of a person sitting on the seat member 2. As a result, the microswitch 43 is switched on when a person sits on the seat member 2 and switched off when the person stands up. Therefore the

microswitch 43 effectively acts as a sensor detecting a person sitting on the seat member 2. The microswitch 43 could be replaced by any other form of sensor.

The positioning of the microswitch 43 at the front of the seat member 2 maximises its sensitivity because the seat member 2 pivots relative to the fittings 6 at the rear of the seat member 2.

The microswitch 43, battery 39 and fan units 17 are electrically connected together by wires 44 forming a circuit which causes the fan units 17 to operate when the microswitch 43 is switched on. The fan units 17 stop operating when the microswitch 43 is switched off, or optionally are arranged to switch off a predetermined time after the microswitch 43 is switched off. Thus, the fan units 17 are operated whilst a person is sitting on the seat member 2 and at this time drives foul air from the toilet pan through the duct 13 to be filtered by the filters 28.

Thus, in use, when a person sits on the seat member 2, this switches the microswitch 43 on, causing the fan units 17 to operate. The fan units 17 draw foul air from the toilet pan into the ducts 13 through the inlet 15 and drive the foul air through the two separate flow paths through the respective filters 18 and out through the outlets 26. Thus, foul air passes through both of the filters 28 which filter the air to deodorise it, and the deodorised air flows out of the seat member 2. The toilet seat 1 provides effective deodorising action, even without a seal between the toilet seat 1 and the toilet pan.